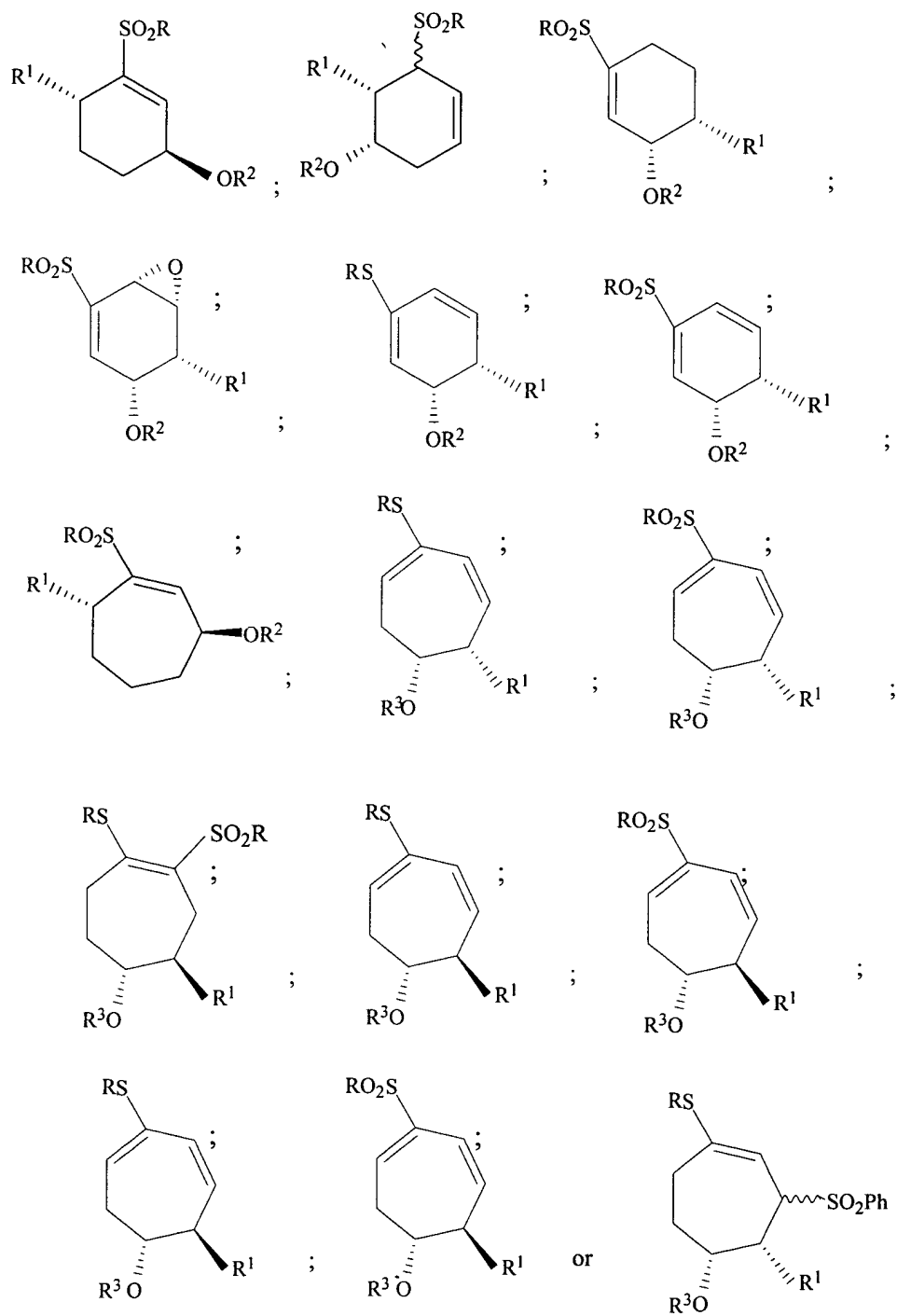


What is claimed is:

1. A compound selected from compounds of the formulae:



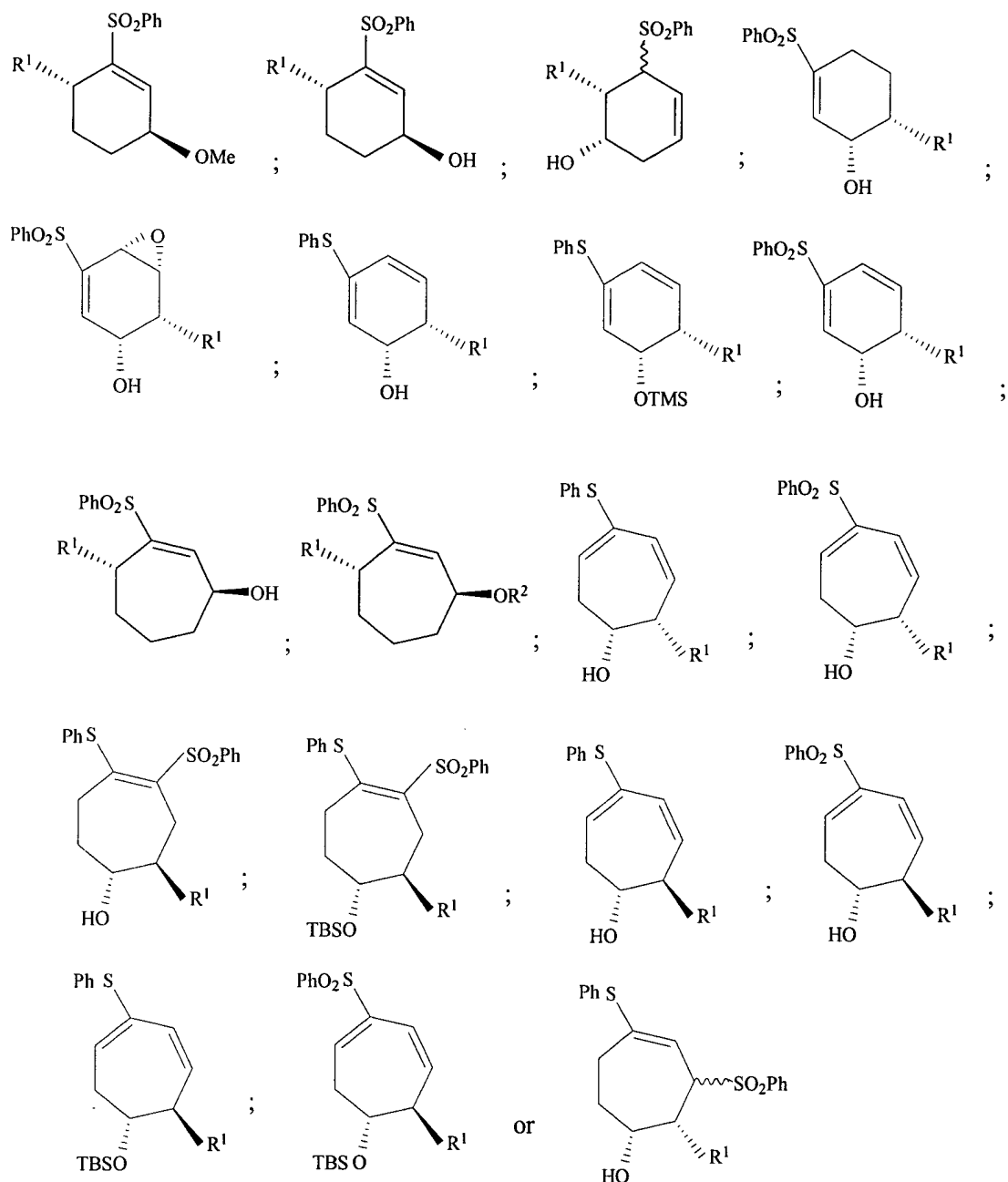
wherein:

R¹ is a C₁-C₅ alkyl group;

R² and R³ are independently selected from H, a C₁-C₄ alkyl group or a blocking group, preferably a silyl-containing blocking group such as a trimethyl silyl group or a t-butyl dimethyl silyl group; and

R is a phenyl or substituted phenyl group wherein the substituted phenyl group is substituted in one instance at the ortho, meta or para position of the phenyl group with a C₁-C₄ alkyl group, a halogen (F, Cl, Br, I) a nitro group, an amine, hydroxyl, alkyl ester (wherein the alkyl group on the ester is a C₁-C₄ alkyl group), alkylether (wherein the alkyl group on the ester is a C₁-C₄ alkyl group) or acyl group, and stereoisomers, pharmaceutically acceptable salts, solvates, and polymorphs thereof.

2. A compound of claim 1, wherein the compound is selected from compounds of the formulae:



and stereoisomers, pharmaceutically acceptable salts, solvates, and polymorphs thereof.

3. The compound

(1*R*)-(3-Benzenesulfonylcyclohepta-2,4-dienyloxy)-trimethylsilane;

(1*R*, 2*R*, 3*R*)-3-Benzenesulfonyl-2-methyl-5-phenylsulfanylcyclohept-4-enol;

(1*R*,2*R*)-(3-Benzenesulfonyl-2-methyl-5-phenylsulfanylcyclohept-4-enyloxy)-trimethylsilane;
 (1*R*,2*S*)-3-Benzenesulfonyl-2-methyl-5-phenylsulfanylcyclohept-4-enyloxy)-*tert*-butyldimethylsilane;
 (1*R*, 2*S*)-2-Methyl-5-phenylsulfanylcyclohepta-3, 5-dienol;
 (1*R*,2*R*)-*tert*-Butyldimethyl-(2-methyl-5-phenylsulfanylcyclohepta-3,5-dienyloxy)-silane;
 (1*S*, 2*S*, 7*S*)-2,7-Dimethyl-4-phenylsulfanylcyclohepta-3,5-dienol;
 (1*S*, 2*S*, 7*S*)-4-Benzenesulfonyl-2,7-dimethylcyclohepta-3,5-dienol;
 (1*S*,2*S*,7*S*)-(4-Benzenesulfonyl-2,7-dimethylcyclohepta-3,5-dienyloxy)-*tert*-butyldimethylsilane;
 (1*S*,2*R*,7*S*)-2-Dimethylaminomethyl-7-methyl-4phenylsulfanylcyclohepta-3,5-dienol;
 (1*R*, 2*R*, 3*R*, 4*S*, 7*R*)-6-Benzenesulfonyl-2,4-dimethyl-8-oxabicyclo[5.1.0]oct-5-en-3-ol;
 (1*S*, 2*R*, 3*R*, 4*S*, 7*S*)-6-Benzenesulfonyl-2,4-dimethyl-8-oxabicyclo[5.1.0]oct-5-en-3-ol;
 (1*R*, 2*S*, 3*R*, 4*S*, 7*R*)-(6-Benzenesulfonyl-2,4-dimethyl-8-oxabicyclo[5.1.0]oct-5-en-3-yloxy)-*tert*-butyldimethylsilane;
 (1*S*, 2*S*, 3*R*, 4*S*, 7*S*)-(6-Benzenesulfonyl-2,4-dimethyl-8-oxabicyclo[5.1.0]oct-5-en-3-yloxy)-*tert*-butyldimethylsilane;
 (1*S*, 2*S*, 3*R*, 4*R*, 5*S*)-7-Benzenesulfonyl-3,5-dimethylcyclohept-6-ene-1,2,4-triol;
 (1*S*,2*S*,5*S*,6*R*,7*S*)-3-Benzenesulfonyl-6-(*tert*-butyldimethylsilanyloxy)-5,7-dimethylcyclohept-3-ene-1,2-diol;
 (1*S*, 2*S*, 3*R*)-Acetic acid 3-benzenesulfonyl-2-methyl-5-oxocycloheptylester;
 (1*E*,3*Z*,5*R*,6*S*)-2-(*tert*-Butyldimethylsilanyloxy)-5-methyl-6-triisopropylsilanyloxycyclohepta-1,3-diene;
 (1*R*,2*R*,3*S*,5*S*,8*E*)-9-(*tert*-Butyldimethylsilanyloxy)-2-methyl-3-triisopropylsilanyloxy-6,7-dioxabicyclo[3.2.2]-non-8-ene;
 1*R*,2*R*,3*R*,4*S*,6*S*)-7-(*tert*-Butyldimethylsilanyloxy)-2,3-dihydroxy-4-methyl-5-triisopropylsilanyloxycycloheptanone;
 (1*R*,2*R*, 3*R*, 4*S*, 6*S*)-7-(*tert*-Butyldimethylsilanyloxy)-2-hydroxy-3-methoxy-4-methyl-5-triisopropylsilanyloxycycloheptanone;
 (2*S*, 4*S*, 5*R*, 6*R*)-2-(*tert*-Butyldimethylsilanyloxy)-6-methoxy-5-methyl-7-oxo-4-triisopropylsilanyloxyheptanoic acid methyl ester;

(1*R*,5*S*,6*R*,7*S*)-3-Benzenesulfonyl-6-(*tert*-butyldimethylsilanyloxy)-5,7-dimethylcyclohept-3-enol;

(1*S*,5*S*,6*R*,7*S*)-3-Benzenesulfonyl-6-(*tert*-butyldimethylsilanyloxy)-5,7-dimethylcyclohept-2-enol;

4-(*tert*-Butyldimethylsilanyloxy)-6-methoxy-3,5-dimethyltetrahydropyran-2-yl]-acetic acid methyl ester;

(2*R*,3*S*,4*S*,5*R*)-[4-(*tert*-Butyldimethylsilanyloxy)-6-hydroxy-3,5-dimethyltetrahydropyran-2-yl]-acetic acid methyl ester;

(2*R*,3*S*,4*S*,5*R*,6*S*)-[4-(*tert*-Butyldimethylsilanyloxy)-6-methoxy-3,5-dimethyltetrahydropyran-2-yl]-acetic acid methyl ester;

(1*S*,5*S*,6*R*,7*S*)-3-Benzenesulfonyl-6-(*tert*-butyl-dimethylsilanyloxy)-5,7-dimethylcyclohept-3-enol;

(2*S*,3*S*,4*S*,5*R*)-[4-(*tert*-Butyldimethylsilanyloxy)-3,5-dimethyl-6-oxotetrahydropyran-2-yl]-acetic acid methyl ester;

(2*S*,3*S*,4*S*,5*R*)-[4-(*tert*-Butyldimethylsilanyloxy)-6-hydroxy-3,5-dimethyltetrahydropyran-2-yl]-acetic acid methyl ester;

(1*S*,4*S*,5*R*,6*R*,7*S*)-2-Benzenesulfonyl-5,7-bis-(*tert*-butyldimethylsilanyloxy)-4,6-dimethylcyclohept-2-enol;

(3*S*,4*R*,5*R*,6*S*,7*S*)-1-Benzenesulfonyl-4,6-bis-(*tert*-butyldimethylsilanyloxy)-7-methoxy-3,5-dimethylcycloheptene;

(2*S*, 3*S*, 4*R*, 5*S*, 6*R*)-3,5-Bis-(*tert*-butyldimethylsilanyloxy)-2-methoxy-4,6-dimethyl-7-oxoheptanoic acid methyl ester;

(3*S*, 6*S*)-(3-Methoxy-6-methylcyclohex-1-enesulfonyl)-benzene;

(*S*)-4-Methylcyclohex-2-enone;

(1*S*, 4*S*)-3-Benzenesulfonyl-4-ethylcyclohex-2-enol;

(3*S*, 6*S*)-(6-Ethyl-3-methoxycyclohex-1-enesulfonyl)-benzene;

(*S*)-4-Ethylcyclohex-2-enone;

(1*S*, 4*R*)-3-Benzenesulfonyl-4-isopropylcyclohex-2-enol;

(3*S*, 6*R*)-(6-Isopropyl-3-methoxycyclohex-1-enesulfonyl)-benzene;

(*R*)-4-Isopropylcyclohex-2-enone;

(1*S*,4*R*)-3-Benzenesulfonyl-4-*tert*-butylcyclohex-2-enol;

(3*S*, 6*R*)-(6-*tert*-Butyl-3-methoxycyclohex-1-enesulfonyl)-benzene;

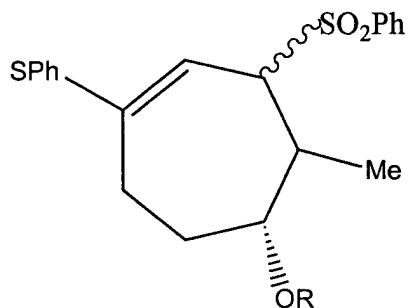
(*S*)-4-*tert*-Butylcyclohex-2-enone;
 (1*S*,4*S*)-3-Benzenesulfonyl-4-(dimethylphenylsilyl)cyclohex-2-enol;
 (1*S*,4*S*)-(2-Benzenesulfonyl-4-methoxycyclohex-2-enyl)-1-dimethylphenylsilane;
 (1*S*, 4*S*)-3-Benzenesulfonyl-4-methylcyclohept-2-enol;
 (3*S*, 7*S*)-1-Benzenesulfonyl-3-methoxy-7-methylcycloheptene; or
 (*S*)-4-Methylcyclohept-2-enone.

4. A compound of claim 1, wherein the compound is produced by oxidation of dienylsulfides through addition of an oxidizing agent such as *m*CPBA.

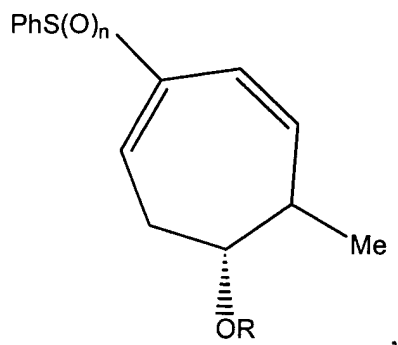
5. A compound of claim 1, wherein the compound is made by a process in which reaction of allyl sulfones with TMS triflate and an amine, such as an organic amine including triethylamine in a solvent such as methylene chloride at reflux effects regiospecific elimination to yield dienylsulfides; the dienylsulfides are oxidized through addition of an oxidizing agent, preferably a peroxide oxidizing agent including *m*CPBA ; and wherein the process can be done one pot or in steps.

6. A compound of claim 1, wherein the compound is made by:

(a) reacting allyl sulfones of the formula



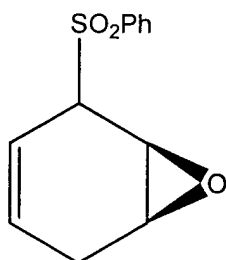
with TMS triflate and an amine, such as an organic amine including triethylamine in a solvent, such as methylene chloride, at reflux to yield a dienylsulfide of the formula



and oxidizing the dienyldisulfide with an oxidizing agent, preferably a peroxide oxidizing agent such as *m*CPBA,

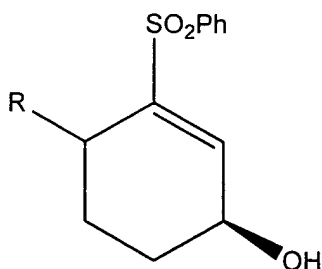
where R is C₁-C₅ alkyl, phenyl, substituted phenyl, vinyl, alkynyl, trimethylsilyl or t-butyltrimethylsilyl and wherein the reaction can be done one pot or in steps.

7. A compound of claim 1, wherein the compound is made by alkylating an epoxyvinylsulfone of the formula

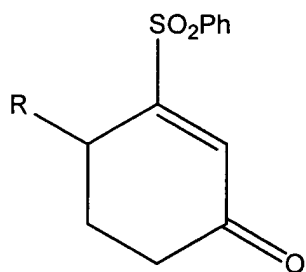


in a reaction medium comprising (R)₂CuLi, a solvent, such as an ether solvent, such as THF, Et₂O or a mixture of THF and Et₂O, where R is a C₁ to C₅ alkyl and wherein the reaction can be done one pot or in steps.

8. A compound of claim 1, wherein the compound is made by oxidizing an allylic alcohol of the formula

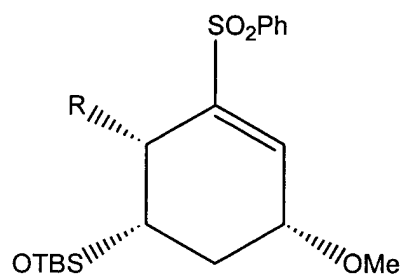


where R is a C₁ to C₅ alkyl, phenyl, substituted phenyl, vinyl, alkynyl, trimethylsilyl or t-butyltrimethylsilyl to yield a β-sulfonyl enone of the formula



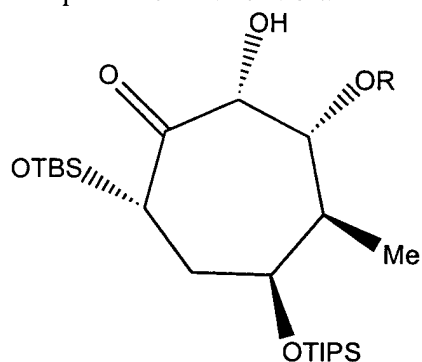
wherein the β -sulfonyl enone is subjected to Michael addition of heterocuprates and subsequent β -elimination of sulfinate, and
 wherein the reactions are done one pot or in steps.

9. A compound of claim 1, wherein the compound is made by reacting a sulfone of the formula

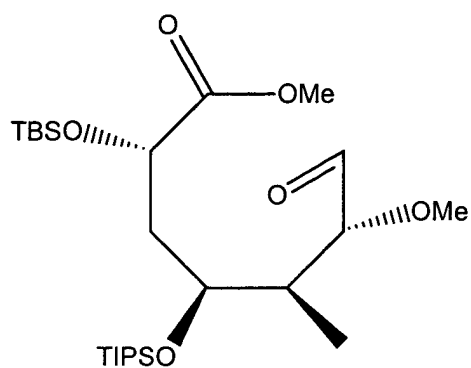


where R is a C_1 to C_5 alkyl, phenyl, substituted phenyl, vinyl, alkynyl, trimethylsilyl or t-butyltrimethylsilyl with one or more alkyl halides.

10. A process comprising a tetraacetate cleavage such as lead tetraacetate cleavage of a compound of the formula



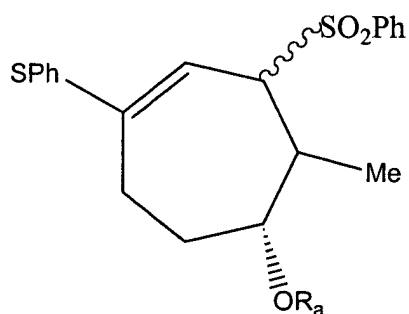
to yield an enantiopure aldehyde-ester of the formula



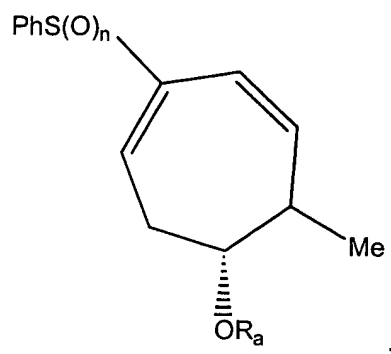
where R is a C₁ to C₅ alkyl, phenyl, substituted phenyl, vinyl, alkynyl, trimethylsilyl or t-butyltrimethylsilyl, the process is done one pot or in steps, and wherein the enantiopure aldehyde-ester is used in the synthesis of the C₁₂-C₁₈ fragment of rhizoxin D.

11. A process comprising:

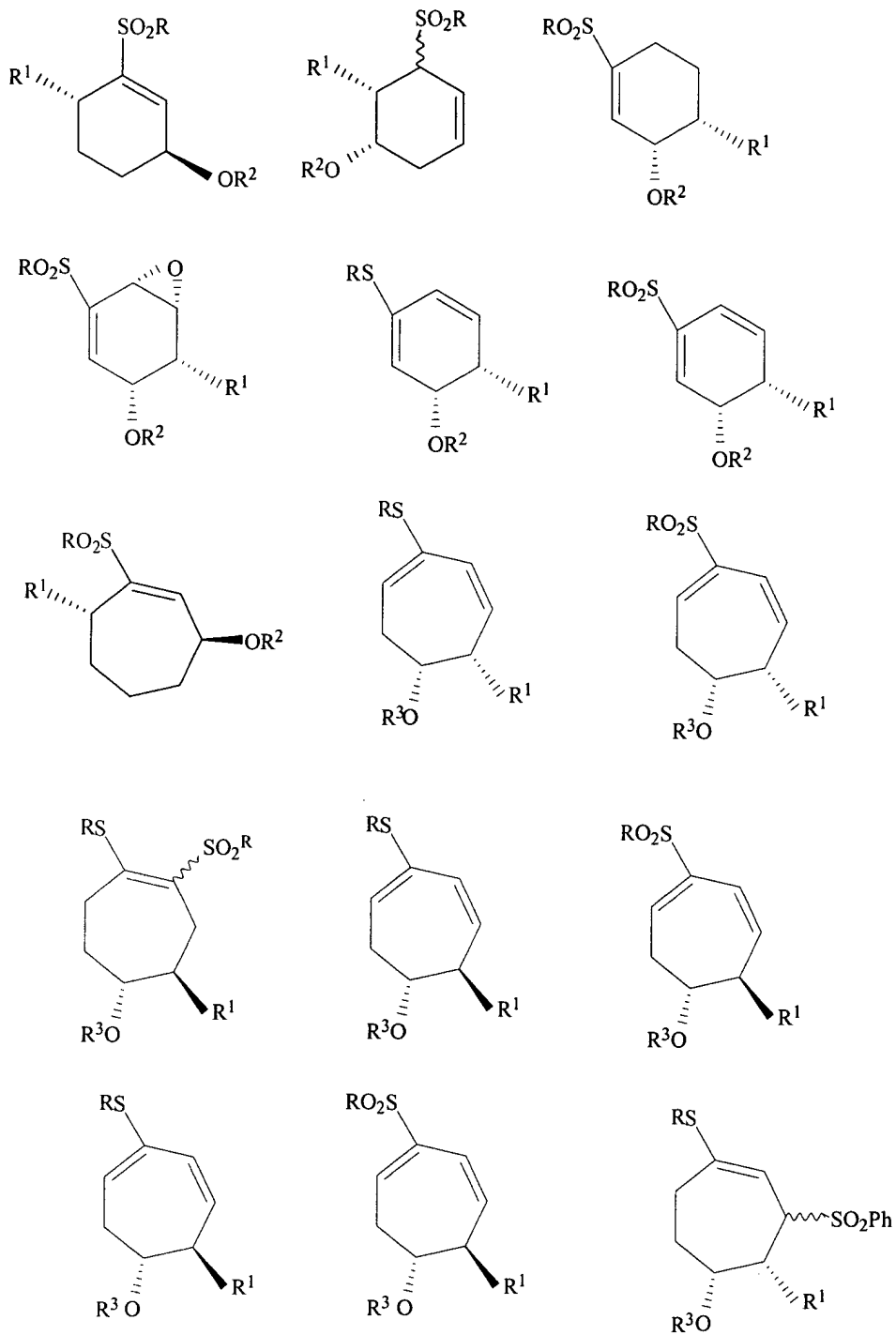
(a) reacting allyl sulfones of the formula



with TMS triflate and an amine, preferably, triethylamine in a solvent, preferably, methylene chloride, at reflux to yield a dienylsulfide of the formula



and oxidizing the dienyldisulfide with an oxidizing agent, preferably a peroxide oxidizing agent such as *m*CPBA, where R_a is C_1 - C_5 alkyl, phenyl, substituted phenyl, vinyl, alkynyl, trimethylsilyl or *t*-butyldimethylsilyl to yield a compound of the formula



wherein:

R^1 is a $\text{C}_1\text{-C}_4$ alkyl group;

R^2 and R^3 are independently selected from H, a $\text{C}_1\text{-C}_4$ alkyl group or a blocking group, preferably a silyl-containing blocking group such as a trimethyl silyl group or a t-butyl dimethyl silyl group; and

R is a phenyl or substituted phenyl group wherein the substituted phenyl group is substituted in one instance at the ortho, meta or para position of the phenyl group with a C₁-C₄ alkyl group, a halogen (F, Cl, Br, I) a nitro group, an amine, hydroxyl, alkyl ester (wherein the alkyl group on the ester is a C₁-C₄ alkyl group), alkylether (wherein the alkyl group on the ester is a C₁-C₄ alkyl group) or acyl group, and wherein the reaction can be done one pot or in steps.